REMARKS

Applicant has carefully reviewed the office action mailed September 28, 2005. The present response is intended to be fully responsive to all points of objection raised by the examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance is hereby solicited.

Applicant has amended independent claims 1, 34, 70, 102, 135 and 138, and cancelled without prejudice claims 137 and 140. Applicant has further amended dependent claims 8, 9, 12, 14, 28, 30, 35, 37, 40, 41, 58, 59, 61, 62, 103 and 109 in line with the amendments to the above independent claims, and to correct a minor spelling error.

It is an object of the present invention to provide a method of, and a system for, deriving a transformation for transforming data conforming a source data schema to data conforming to a target data schema. The derived transformation advantageously transforms data conforming to the source data schema directly to data conforming to the target data schema.

It is a second object of the invention to provide a method of, and a system for, building an ontology at least partially based on components of a received schema.

Newly Cited Prior Art

As indicated above, attached please find a supplemental Information Disclosure Statement containing prior art cited by a foreign patent office in a counterpart patent application. The art cited of particular relevance is Morgenstern (U.S. 5,970,490).

Morgenstern teaches a method for processing heterogeneous data to drive program generation of information. In particular high level specifications are used to drive application generators which tailor and/or create the necessary transformations, programs for data access, and software interfaces. The result is generation of a specific information mediator or information bridge for use between disparate information resources. (Col. 5, line 18 – 23).

The subject invention is characterized by generating a direct transformation from an indirect mapping. Each of the source data schema and the target data schema are mapped

into a common ontology model. The data schema relationships are analyzed and a direct transformation from the source data to the target data is developed, the direct transformation occurring without requiring the import of the source data to the ontology.

Such an invention is advantageous and novel at least in that when a plurality of data schema are encountered, the number of mappings are reduced to the number of data schema, i.e. each data schema is mapped to the common ontology, and data transformations between any 2 data schema can be developed. Thus, the number of mappings are minimized to be equal to the number of data schema.

Morgenstern requires a mapping for each source to target transformation. Thus, for a plurality of data schema which require transformation from one to the other, the number of mappings increases as the product of the number of data schema.

By way of illustration of the novelty, suppose we need to exchange data in all combinations between 100 different data sources which use 100 data schemas. In accordance with the prior art, there are two possible approaches.

(A) Every data schema is mapped to every other data schema requiring 100x99=9,900 different mappings to be designed. From this 9,900 different mappings data transformation code can be derived.

(B) Each of the 100 schemas is mapped to a common model requiring just 100 mappings; and then 100 data transformations are derived. Actual data must always be transformed twice, first from its source format to the neutral format and then from the neutral format to the target format, which is inefficient.

The subject invention in contrast is directed to a method and system whereby only 100 mappings need to be created and all the direct end-to-end transformations may be automatically inferred. In the above non-limiting example then we get all 9,900 combinations of direct mappings for the price of 100 mappings.

Additionally, Morgenstern does not teach building an ontology model at least partially based on components of the received at least one data schema.

Provisional Obviousness Type Double Patenting Rejection

Claims 1 – 33, 34 – 69 and 135 – 137 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 5 and 28 of copending application 10/104,785 in view of Klein.

In the interest of concluding prosecution, and without prejudice, applicant has attached a duly executed terminal disclaimer in compliance with 37 CRF 1.321(c), and has further enclosed the required fee under 37 CFR 1.20(d).

Rejection under 35 U.S.C. §101:

Claims 1, 70 and 102 stand rejected under 35 U.S.C. 101 as being directed to no-statutory subject matter.

Claim 1 has been amended to positively recite that both the source data schema and the target data schema define data on a computer readable media. Claim 1 has been further amended to recite that the transformation is automatically derived, and that the transformation transforms data conforming to the source media to data conforming to the target media.

Claim 70 has been amended to positively recite that the received at least one data schema defines data on a computer readable media, the ontology model is at least partially automatically built and that the ontology model is at least partially based on components of the received at least one data schema.

Claim 102 has been amended to positively recite that the received at least one data schema defines data on a computer readable media and that the ontology model is at least partially based on components of the received at least one data schema.

Claims 1, 70 and 102 as amended thus clearly produces a "useful, concrete and tangible result". *State Street*, 149 F.3d at 1373, 47 USPQ2d at 1601-02. Specifically, claim 1 produces a transformation which is operable to transform data from one schema to a second different schema. Such a transformation, which allows for directly transforming data, is

useful at least for importing data from one application to another, where the two applications use different data schemas. Claims 70 and 102 produce an ontology model advantageously based on a received data schema. Such an ontology model advantageously allows for the transformation of data, without requiring an initial ontology model broad enough to cover all possible data schema. Further, this method and system provides a novel and advantageous way to at least partially automate the creation of an ontology, for the purposes of providing a transformation for mapping the data schema, where creating such an ontology which would otherwise require manual error-prone work.

Rejection under 35 U.S.C. §112:

Claims 137 and 140 stand rejected under 35 U.S.C. 112 as failing to comply with the written description requirement. In the interest of concluding prosecution, claims 137 and 140 have been cancelled without prejudice.

Rejection under 35 U.S.C. §102:

Claims 1 – 8, 20, 24, 26 – 41, 70 – 71 and 135 – 140 stand rejected under 35 U.S.C. 102(e) as being anticipated by Wachtel (U.S. Patent S/N 6,847,947)

A. Applicant has amended independent claim 1 to positively recite that the derived transformation transforms data conforming to the source data schema directly to data conforming to the target data schema. Thus, while it is necessary to utilize the ontology to derive the data transformation from the source data schema to the target data schema it is not necessary to utilize the ontology when executing the data transformation but rather the transformation specifies the transformation of data directly from source data schema format to target data schema format – this creates novel and advantageous efficiencies at the time of applying the data transformation. Data transformation execution conforming to amended claim 1 is accomplished directly by the derived transformation, without recourse to the ontology.

Wachtel contrastingly, converts received data by populating a "*run-time instance of the ontology* representing the semantic and atomic objects included within the LSO" (logical search objects). (Col. 16, line 40 – 45)

Wachtels "LSO is a self contained software object including a set of components that, when combined together, encapsulate the capability to connect to a data provider, generate a knowledge instance by extracting and parsing the data returned by the data provided in response to a request, and deliver the knowledge instance *into the ontology* for use by the current instance of the request so that the data can be consolidated into a result set" (Col. 16, line 12 – 17). Further Wachtel does not teach how to transform between two different data schemas.

Amended claim 1 is therefore not anticipated as each and every element as set forth in the claim is not found, either expressly or inherently described, in the single prior art reference (*Verdegaal Bros. V. Union Oil Col of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053* (Fed. Cir. 1987).

Amended claim 1 is thus deemed patentable over Wachtel Dependent claims 2 – 8, 20, 24 and 26 – 33 are also deemed patentable being dependent thereon.

B. Applicant has amended independent claim 34 to positively recite that the derived transformation transforms data conforming to the source data schema directly into data conforming to the target data schema. Thus, while it is necessary to utilize the ontology to derive the data transformation from the source data schema to the target data schema it is not necessary to utilize the ontology when executing the data transformation but rather the transformation specifies the transformation of data directly from source data schema format to target data schema format – this creates novel and advantageous efficiencies at the time of applying the data transformation. Data transformation execution according to amended claim 34 is accomplished directly by the derived transformation, without recourse to the ontology.

As indicated above, Wachtel differs from the subject invention at least in that Wachtel converts received data by populating a "*run-time instance of the ontology* representing the semantic and atomic objects included within the LSO" (logical search objects). (Col. 16, line 40 – 45). Thus, no derived transformation which transforms data conforming to the source

data schema directly into data conforming to the target data schema is taught or suggested by Wachtel, which requires an instance of the ontology to convert the received data. Further Wachtel does not teach how to transform between two different data schemas.

Amended claim 34 is therefore not anticipated as each and every element as set forth in the claim is not found, either expressly or inherently described, in the single prior art reference (*Verdegaal Bros. V. Union Oil Col of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053* (Fed. Cir. 1987). Claims 35 -41 are also deemed patentable being dependent thereon.

C. Applicant has amended independent claim 70 to positively recite that the ontology model is at least partially based on components of the received at least one data schema. Thus, the ontology model of the subject invention is not fixed, but is rather at least partially built responsive to the received at least one data schema.

Wachtel contrastingly, using a fixed pre-existing "one size fits all" ontology. Specifically, "the intelligent data assimilation system ontology provides a set of well-founded constructs that are used to build meaningful higher-level knowledge. Basic terms in the intelligent data assimilation system ontology are selected such that basic foundational concepts and distinctions are defined and specified. *The basic terms chosen form a complete set, whose relationship to one another is defined using formal techniques.... Definitions included in an intelligent data assimilation system ontology are persistent, reused extensively, and have global scope within an intelligent assimilation system*" (col. 7, line 23 – 48).

Amended claim 70 is therefore not anticipated as each and every element as set forth in the claim is not found, either expressly or inherently described, in the single prior art reference (*Verdegaal Bros. V. Union Oil Col of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053* (Fed. Cir. 1987). Dependent claim 71 is also deemed patentable being dependent thereon.

D. Applicant has amended independent claim 135 to positively recite that the derived transformation transforms data conforming to the source data schema directly into data conforming to the target data schema. Thus, it is not necessary to utilize the ontology to

accomplish the data transformation from the source data schema to the target data schema. Data transformation according to amended claim 135 is accomplished directly by the derived transformation, without recourse to the ontology.

As indicated above, Wachtel differs from the subject invention at least in that Wachtel converts received data by populating a "*run-time instance of the ontology* representing the semantic and atomic objects included within the LSO" (logical search objects). (Col. 16, line 40 – 45). Thus, no derived transformation which transforms data conforming to the source data schema directly into data conforming to the target data schema is taught or suggested by Wachtel, which requires an instance of the ontology to convert the received data. Further Wachtel does not teach how to transform between two different data schemas.

Amended claim 135 is therefore not anticipated as each and every element as set forth in the claim is not found, either expressly or inherently described, in the single prior art reference (*Verdegaal Bros. V. Union Oil Col of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053* (Fed. Cir. 1987). Claim 136 is also deemed patentable being dependent thereon.

E. Applicant has amended independent claim 138 to positively recite that the ontology model is at least partially based on the received at least one data schema. Thus, the ontology model of the subject invention is not fixed, but is rather at least partially built responsive to the received at least one data schema.

Wachtel contrastingly, using a fixed pre-existing "one size fits all" ontology. Specifically, "the intelligent data assimilation system ontology provides a set of well-founded constructs that are used to build meaningful higher-level knowledge. Basic terms in the intelligent data assimilation system ontology are selected such that basic foundational concepts and distinctions are defined and specified. *The basic terms chosen form a complete set, whose relationship to one another is defined using formal techniques.... Definitions included in an intelligent data assimilation system ontology are persistent, reused extensively, and have global scope within an intelligent assimilation system*" (col. 7, line 23 – 48).

Amended claim 138 is therefore not anticipated as each and every element as set forth in the claim is not found, either expressly or inherently described, in the single prior art

reference (*Verdegaal Bros. V. Union Oil Col of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053* (Fed. Cir. 1987). Dependent claim 139 is also deemed patentable being dependent thereon.

Rejection under 35 U.S.C. §103:

F. Claims 9 -19, 21 -23, 25, 42 – 69 and 72 -134 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Wachtel in view of Lindberg (U.S. Patent S/N 6,732,109)

Independent claim 1, on which claims 9 – 19, 21 – 23 and 25 depend has been amended to positively recite that the derived transformation transforms data conforming to the source data schema directly to data conforming to the target data schema. Thus, it is not necessary to utilize the ontology to accomplish the data transformation from the source data schema to the target data schema. Data transformation according to amended claim 1 is accomplished directly by the derived transformation, without recourse to the ontology.

Wachtel contrastingly, converts received data by populating a "*run-time instance of the ontology* representing the semantic and atomic objects included within the LSO" (logical search objects). (Col. 16, line 40 – 45).

Lindberg teaches the use of a normalized object model, called an information model (IM). The information is modeled in an abstract fashion, i.e. in accord with the nature of the information (objectively) as opposed to being modeled to suite a specific need (subjectively). (Col 7, line 47 -55). The information model contains a normalized version of the database design, allowing meaningful names to be used for entities and attributes, and enabling additional documentation to be specified, making the model easier to understand. The information model contains a schema (Col. 8, line 33 -55). The IM through its various entities (having respective attributes, relationships and behavior) implemented as XML files, provides access to the data in the underlying database. (Col. 14, line 7 – 10).

Neither Lindberg nor Wachtel teach receiving a source data schema and a target data schema, the source data schema being different from the target data schema, mapping the source data schema and the target data schema in a single ontology model, and deriving a transformation for transforming data conforming to the source data schema directly to the

target data schema, where the derived transformation transforms data directly from the source data schema to the target data schema. Thus, the limitations of amended claim 1 are neither taught nor suggested by Lindberg or Wachtel. Dependent claims 9 -19, 21 -23, 25, depend from claim 1, and thus contain all the limitations of claim 1. To establish *prima facie* obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Furthermore, the examiner has not rejected claim 1 as being obvious under 35 U.S.C. 103. Dependent claims 9 -19, 21 -23, 25, depend from claim 1. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988).

G. Independent claim 34, on which claims 42 – 69 depend has been amended to positively recite that the derived transformation transforms data conforming to the source data schema directly into data conforming to the target data schema. Thus, it is not necessary to utilize the ontology to accomplish the data transformation from the source data schema to the target data schema. Data transformation according to amended claim 34 is accomplished directly by the derived transformation, without recourse to the ontology.

As explained above, neither Lindberg nor Wachtel teach a schema receiver receiving a source data schema and a target data schema, a mapping processor mapping the source data schema and the target data schema in a single ontology model, and a transformation processor deriving a transformation for transforming data conforming to the source data schema to the target data schema, where the derived transformation transforms data directly from the source data schema to the target data schema. Thus, the limitations of amended claim 34 are neither taught nor suggested by Lindberg or Wachtel. Dependent claims 42 - 69 depend from claim 34, and thus contain all the limitations of claim 34. To establish *prima facie* obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Furthermore, the examiner has not rejected claim 34 as being obvious under 35 U.S.C. 103. Dependent claims 42 - 69 depend from claim 34. If an independent claim is

nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988)

H. Applicant has amended independent claim 70 to positively recite that the ontology model is at least partially based on components of the received at least one data schema. Thus, the ontology model of the subject invention is not fixed, but is rather at least partially built responsive to the received at least one data schema.

Wachtel contrastingly, using a fixed pre-existing "one size fits all" ontology. Specifically, "the intelligent data assimilation system ontology provides a set of well-founded constructs that are used to build meaningful higher-level knowledge. Basic terms in the intelligent data assimilation system ontology are selected such that basic foundational concepts and distinctions are defined and specified. *The basic terms chosen form a complete set, whose relationship to one another is defined using formal techniques.... Definitions included in an intelligent data assimilation system ontology are persistent, reused extensively, and have global scope within an intelligent assimilation system*" (col. 7, line 23 – 48).

Lindberg teaches the use of a normalized object model, called an information model (IM). The information is modeled in an abstract fashion, i.e. in accord with the nature of the information (objectively) as opposed to being modeled to suite a specific need (subjectively). (Col 7, line 47 -55). The information model contains a normalized version of the database design, allowing meaningful names to be used for entities and attributes, and enabling additional documentation to be specified, making the model easier to understand. The information model contains a schema (Col. 8, line 33 -55). The IM through its various entities (having respective attributes, relationships and behavior) implemented as XML files, provides access to the data in the underlying database. (Col. 14, line 7 – 10). Lindberg thus neither teaches nor suggests building an ontology model at least partially based on components of the received schema and neither teaches nor suggests any method for automating the building of the ontology.

Neither Wachtel nor Lindberg teach all the limitations of amended claim 70. Dependent claims 72 -101 depend from claim 70, and thus contain all the limitations of claim

70. To establish *prima facie* obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Furthermore, the examiner has not rejected claim 70 as being obvious under 35 U.S.C. 103. Dependent claims 72 - 101 depend from claim 70. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988).

I. Applicant has amended independent claim 102 to positively recite that the ontology model built by the model builder is at least partially based on components of the received at least one data schema. Thus, the ontology model of the subject invention is not fixed, but is rather at least partially built responsive to the received at least one data schema.

Wachtel contrastingly, using a fixed pre-existing "one size fits all" ontology. Specifically, "the intelligent data assimilation system ontology provides a set of well-founded constructs that are used to build meaningful higher-level knowledge. Basic terms in the intelligent data assimilation system ontology are selected such that basic foundational concepts and distinctions are defined and specified. *The basic terms chosen form a complete set, whose relationship to one another is defined using formal techniques.... Definitions included in an intelligent data assimilation system ontology are persistent, reused extensively, and have global scope within an intelligent assimilation system*" (col. 7, line 23 – 48).

Lindberg teaches the use of a normalized object model, called an information model (IM). The information is modeled in an abstract fashion, i.e. in accord with the nature of the information (objectively) as opposed to being modeled to suite a specific need (subjectively). (Col 7, line 47 -55). The information model contains a normalized version of the database design, allowing meaningful names to be used for entities and attributes, and enabling additional documentation to be specified, making the model easier to understand. The information model contains a schema (Col. 8, line 33 -55). The IM through its various entities (having respective attributes, relationships and behavior) implemented as XML files, provides access to the data in the underlying database. (Col. 14, line 7 – 10). Lindberg thus

neither teaches nor suggests building an ontology mode at least partially based on components of the received schema.

Neither Wachtel nor Lindberg teach all the limitations of amended claim 102. Dependent claims 103 -134 depend from claim 102, and thus contain all the limitations of claim 102. To establish *prima facie* obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Furthermore, the examiner has not rejected claim 102 as being obvious under 35 U.S.C. 103. Dependent claims 103 - 134 depend from claim 102. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988)

SUMMARY

Independent claims 1, 34, 70, 102, 135 and 138 have been amended to positively recite limitations patentable over the prior art cited. Claims 137 and 140 have been cancelled without prejudice. Claims 2 – 33, 35 – 69, 71 – 101, 103 – 134, 136 and 139 are also deemed patentable being respectively dependent on the above amended independent claims.

CONCLUSION

In view of the foregoing, reconsideration and allowance of all pending claims (i.e., claims 1 – 136, 138 - 139) is respectfully requested. The Examiner is encouraged to contact Applicant's undersigned agent by telephone through the below telephone number, or by e-mail at Simonka@Barak.net.il if it would in any way aid in the advancement of this application to issue.

Respectfully submitted,

Dated: January 25, 2006

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